# *One Hundred Thousand Whys*: A Classic in Chinese Book History

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**Abstract**

*One Hundred Thousand Whys* is a widely known popular science book in China, which has been developing people's systematic understanding of basic sciences for generations. This encyclopedic book covers a wide range of topics, inspiring people's observations and pondering about the world by asking nonspecialist questions. Different questions are raised and followed by answers that satisfy readers' scientific curiosity; cultivate the scientific literacy of generations of children, and even of adults; and make up for the shortcomings of scientific education in China's schools. In the past half-century, it has become a legend and classic in Chinese publishing history.

**Keywords**

One Hundred Thousand Whys, popular science book, scientific curiosity, scientific literacy, China

## *One Hundred Thousand Whys* in China

As a popular science book, *One Hundred Thousand Whys* has never been surpassed in China. Over half a century since its first publication in 1961, as a popular science book that has affected generations of teenagers and children in modern China, this unfailing book has successfully passed on and spread the heritage of science and has become the leader in Chinese popular

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science books. It is even regarded as synonymous with "encyclopedia" in China. No other popular science readings have stood the test of such a long time and produced such huge social effects. Its birth has become a legend and a classic, with no parallel in Chinese publishing history (Tang, 2008).

Since the Chinese government issued a call for *Marching Forward to Sciences* in 1956, Juvenile and Children's Publishing House was encouraged and anxious to publish some good popular science books for Chinese children. At that time, almost no original popular science books were available in the Chinese market (X. Liu & Shi, 2009). Guozhong Wang, the editor-in-chief of *One Hundred Thousand Whys*, reported the difficulty in creation at that time: There were few popular science writers, and contributions were extremely scarce (Yu & Rao, 2003). However, such a shortage environment contributed to an extremely booming market demand (X. Chen, 2006).

The title, *One Hundred Thousand Whys*, came from a book with the same name written by Ilya Yakovlevich Marshak, a Soviet popular science writer, in which he cited a verse of Joseph Rudyard Kipling, the winner of the 1907 Nobel Prize for Literature: "5,000 wheres? 7,000 hows? 100,000 whys?" (Marshak, 1938). While this was later proved to be a mistake, since Kipling's original poem reads, "One million hows, two million wheres, and seven million whys!" (Ye, 2015), this interesting error makes the name of the book easier to read aloud and more impressive in Chinese. The target readership was originally considered as children only, and it went on sale on International Children's Day in1961. Since it was not initially valued optimistically, only 5,000 copies of the first volume were printed (Ye, 2015). However, its quality and appeal were quickly recognized, and soon many readers were familiar with it. Mainstream newspapers reported it as a hit (Dong, 1962). *China Youth Daily* and *Youth Magazine* then published it in installments, treating *One Hundred Thousand Whys* as adolescent literature. Government officials even suggested that "all young cadres in the country should learn from this book," and the late Premier Enlai Zhou liked this book so much that he kept it in his car for convenience of reading (Ye, 2015). Many teachers also use it as reference material (*Liberation Daily*, 1962). By April 1964, before the second edition came out, the first edition had already been reprinted 11 times in 3 years (Ye, 2015). Readers were desperate for books, resulting in a crazy era for reading in China.

During the last century, Chinese education was at a low level. According to the National Bureau of Statistics' open access data, the secondary school enrolment ratio was 28% in 1970 and still as low as 37% 20 years later, in 1990. When the first edition of *One Hundred Thousand Whys* was published in 1961, at the time of the Great Chinese Famine, China had a total population of 660 million, 83.3% of whom lived in rural areas. When the majority

**Table 1.** Publishing Data of *One Hundred Thousand Whys*.

| | Edition 1 | Edition 2 | Edition 3 | Edition 4 | Edition 5 | Edition 6 | Total |
|---|---|---|---|---|---|---|---|
| Year of publication | 1961 | 1964 | 1970 | 1980 | 1999 | 2011 | — |
| Number of volumes | 8 | 14 | 21 | 24 | 12 | 18 | — |
| Circulation of copies (in millions) | 5.8 | 40 | 37 | 30 | 8 | 3 | 123.8 |
| Ownership per 100 citizens | 0.88 | 5.73 | 4.52 | 3.06 | 0.64 | 0.22 | — |

*Note*. The table is compiled according to the data in *Stories behind One Hundred Thousand Whys* (Ye, 2015).

of Chinese could not read and were suffering from overriding problems of food and clothing, cultural consumption was considered to be extravagant. Even so, over 40 million copies of the second edition were printed in 1964, which meant that 6 of every 100 citizens owned a copy of *One Hundred Thousand Whys* (see Table 1). During the Cultural Revolution (1966-1976), schools in China were mostly suspended, while the third edition, published in 1970, reached 37 million copies. It eventually became the only book to exceed the *Selected Works of Mao Zedong* in circulation since the founding of the People's Republic of China. Table 1 gives detailed data about each edition of *One Hundred Thousand Whys*.

The first edition contained eight volumes, 1,484 questions, and 1.05 million words, and a total of 5.8 million copies were printed. More than 150 authors from 20 institutes were involved in compiling it, among whom Yonglie Ye made the greatest contribution: He wrote 326 "whys" in the first edition and was eventually the only author who was involved in all six editions of this book; only 20 years old at the time of the first edition, he was 73 years of age when the sixth edition was published. The subsequent five editions were published in 1964, 1970, 1980, 1999, and 2011, respectively.

The 1980 version is known as the most classic version (Figure 1). Like millions of children in China, Guoyan Wang (one author of this paper) grew up reading *One Hundred Thousand Whys*. When she was 8 years old, in 1988, her father bought this book as a present and expected that she would no longer ask questions all day since answers could be found there. Wang knew that this would be the only science book she could have at that time, so she did a crazy thing: she learned by heart all the *whys* from cover to cover until it fell to pieces. Wang's original interest in science came from this book.

**Figure 1.** Photo of *One Hundred Thousand Whys* (1980 version).
*Note*. Photo provided by the Juvenile and Children's Publishing House.

From the end of the 1980s, the rise of China's cultural industry and the lack of copyright protection led to hundreds of copycat versions of this book on the market. Different versions from different Chinese publishing houses could be found, such as children's versions, infant versions, teenagers' versions, and even comic versions. This confused the reader as to which was the authentic one. As a result, the circulation of the fifth and sixth editions by the Juvenile and Children's Publishing House was heavily reduced. The book has total sales of 123.8 million copies since 1961, per data from the Juvenile and Children's Publishing House. Meanwhile, however, *One Hundred Thousand Whys* has become a generic term for encyclopedias and popular science books all over China.

In 1998, the China National Science and Technology Progress Award, which rewards innovations at the frontier of science, was awarded to a book for the first time, to reward *One Hundred Thousand Whys* for its outstanding contribution to the popularization of science in China. Academician Qide Han, the chairman of the Chinese Academy of Science Association, said, "*One Hundred Thousand Whys* is an extraordinary publication, which has made an irreplaceable contribution to the improvement of the scientific literacy of the whole people in China in the past 50 years" (Ye, 2015, p. 149). Academician Qide Han subsequently assumed the role of editor in chief of the sixth edition. The writing of this edition was entrusted to the best science talents in China. Twenty-one members of the Chinese Academy of Sciences (CAS) and the Chinese Academy of Engineering (CAE) took charge of compiling the various

volumes, while the editorial board included 115 members of CAS and CAE. Moreover, over 700 outstanding scientists in various domains, from all over the world, worked together to compile the 2011 version of *One Hundred Thousand Whys*. Capacity increased in the process of revision; the sixth edition, which is the latest, has 18 volumes and includes 4,500 questions.

For a long time, Chinese people suffered weak levels of education and scientific literacy, so *One Hundred Thousand Whys* has become an indelible memory for many Chinese. Each article in the book is terse, forceful, and vivid, explaining profound theories in plain language. Although children were initially regarded as the main target readers of this book, the reading community actually covers all age-groups and can almost equally satisfy adults' requirements for scientific education. Children, intellectuals, government officials, and even farmers can read *One Hundred Thousand Whys*. It is exactly as the advertisement says on the box: "*One Hundred Thousand Whys* is a useful book in all your life and will be unforgettable for several generations."

## A Brief History of Popular Science Publications in China

China's special historical environment bred this phenomenal popular science book. For quite a long period in recent times, science and technology in China were trapped in a backwater (Needham, 2006). The traditional concept of science popularization in China was relatively superficial and mainly aimed at the elimination of illiteracy (Jiang, 2006). The history of popular science books in China can be roughly divided into four stages, namely, science enlightenment from 1840 to 1919, science popularization from 1919 to 1949, the valley stage from 1949 to 1990, and the flourishing stage of popular science books from 1990 to now.

In the science enlightenment stage from 1840 to 1919, after the Opium War, popular science books were introduced to China, published by foreign missionary publishing organizations. During this period, a total of 98 popular science books were translated (Wang, 2007). After 1889, Chinese scholars tried to translate foreign books, such as Darwin's *Evolution and Ethics*, and *From the Earth to the Moon* and *Twenty Thousand Leagues Under the Sea* by Jules Verne, a French popular science writer. At this stage, science books were mostly translated from foreign books, whose audiences were mainly the intellectual elites.

The science popularization stage started with the New Culture Movement in 1915. Before this, literary education in China had always been of high quality, but knowledge about nature had been lacking for at least 2,000 years in Chinese education history (Cai, 1924). In the early 20th century, a time of

peril for China, intellectuals who had received Western education launched an "anti-traditional, anti-Confucian" social movement, hoping to find a route to development by learning from Western countries. The New Culture Movement raised the flag of science with enthusiasm, with the aim of enhancing the level of scientific culture and production throughout society (Yang & Shen, 1963). A key event in this period is the Movement of the Marrying-down of Science, which meant to spread science from the elite to the general public (Tao, 1991). The compilation of children's science book series was an important part of this movement (T. Chen, 2009). During this period, quite a number of popular science books were translated or created. With the implementation of the Marrying-down of Science, science communication entered the popularization stage. The audiences of science communication expanded from the intellectual elite to the general public and children for the first time.

During the period from 1949 (the establishment of the People's Republic of China) to 1992, an economic downturn and political upsurge left China's cultural development in a state of retrenchment; more seriously, during the 10 years of the Great Cultural Revolution of China (1966-1976), almost no books were either imported or written. At that time, however, a medical book, *Handbook for Barefoot Doctors*, which aimed at health promotion, became popular throughout the country, and each country doctor—or even each family—owned a copy.

China joined the Universal Copyright Convention in 1992, followed by prosperity and development in the popular science publishing industry. Popular science books changed from the simple introduction of scientific knowledge to focusing on scientific method and principles, which were then referred to as universal popular science books. *A Brief History of Tim*e, written by Stephen Hawking, was a major success. With the rapid development of children's books, a great number of excellent popular science books, such as *The Magic School Bus* from America, *My First Science Comic Books* from Korea, and *Terrible Science* and *Cambridge Encyclopedia for Children* from Britain were introduced. *Souvenirs Entomologiques*, written by Fabre, has over 20 different versions on the Chinese market.

In the popular science publication field, recomposition, translation, and compilation are always the mainstream activities (Zhang, 2016). At present, although Chinese original popular science books on the market have increased greatly in number, high-quality books are still rare, and many do not appeal to a wide audience (Wu & Qiu, 2012). Over 6,000 different popular science books for children are published each year in China, of which almost all the bestsellers are introduced from foreign countries (Ma, 2014). During the period from 2014 to 2016, according to statistics from Dangdang.com (the leading book-selling website in China), among the top 20 popular science

books in the ranking list of popular science books and encyclopedias for children, only *One Hundred Thousand Whys, World History for Children, Chinese Geography for Children*, and *The Five Thousand Years of China* were Chinese original publications. The rest were all imported editions of foreign language books. The other three sets of original Chinese books are all in the social sciences. This means that *One Hundred Thousand Whys* still ranks first among original popular science books of the natural sciences in China, and now, it has become a phenomenal book that has never been surpassed during the past 50 years.

## Satisfying Curiosity and Improving Scientific Literacy

*One Hundred Thousand Whys* reveals science around us in the form of questions such as "Why is the sky blue?" "How are humans born?" "Why can the Sun emit light?" and "Why can fish breathe in the water?" Many questions that are frequently asked in the process of growing up are included in this book; moreover, the content has been enriched by collecting interesting questions from the public (T. Liu & Zhou, 2011). This book is drawn from real life and, thus, is quite practical; in addition, owing to its illustrated form, the content is relaxed and vivid.

Children are at a stage of exploring the world, during which they ask a variety of questions. Argos, a British retailer, made an investigation of 1,500 children and pointed out that, on average, a 4-year-old child asks 73 "whys" every day, more than half of which cannot be addressed by their parents.[1] In *One Hundred Thousand Whys*, the solutions to these most frequently asked questions can greatly satisfy children's curiosity. This book uses questions to drive scientific interest and has become a precious gift for many Chinese children; furthermore, as a result of reading this book, some people have been inspired and finally become famous scientists. For example, Jingzhong Zhang, a famous mathematician and a member of the CAS, once remarked that he had been so impressed with *One Hundred Thousand Whys* in his boyhood that he kept rereading it. When encountering some interesting or unknown questions, curiosity drove him to think and study further, and even to read other books to seek answers. The reading of *One Hundred Thousand Whys* became scientific enlightenment for him (Chen, 2004).

Curiosity does not only belong to children; it is proved to also be the source of truth and the initial drive to explore the world. Many Nobel Prize winners, in their biographies, attribute their first steps on the road of science

to initial curiosity (Agar, 2017). The aside made by Albert Einstein in private correspondence in 1952, 'I have no special talents. I am only passionately curious,' has now become a meme.

The questions in *One Hundred Thousand Whys* are not only interesting but also effective in introducing basic scientific knowledge. For example, "Why are beverage bottles usually not full?" This is because a full beverage bottle may explode when being heated; accordingly, the scientific principle of thermal expansion and cold contraction is explained. "Why can a vacuum bottle preserve heat?" This is due to the fact that the vacuum interlayer can block thermal transmission; accordingly, three modes of thermal transmission, namely, conduction, convection, and radiation, are introduced in detail. "Why cannot birds be electrocuted by high-voltage power lines but people can?" This is because people who stand on the ground can form a loop when touching the power lines; thus, the knowledge of voltage and current are introduced. "Why do we always use the decimal system in counting?" This is because a man has 10 fingers; accordingly, the related mathematical knowledge of scientific notation is elaborated. "Why cannot food be placed in some plastic bags?" This is because colored plastic bags are always colored by benzene, and benzene is a kind of strong carcinogen; accordingly, chemical and biological knowledge, as well as health communication, are explicated.

Unlike many traditional textbooks and popular science books, in which boring principles are first introduced and the applications are followed, *One Hundred Thousand Whys* first arouses the readers' concerns and interests using daily questions; then, the readers are driven to seek solutions, and thus, profound impressions of the relevant scientific knowledge are made, which can even stay in people's memories all their lives.

In terms of knowledge structure, *One Hundred Thousand Whys* includes all-round sciences in an encyclopedic format. Systematic learning can contribute to civic scientific literacy. The first edition included eight volumes—mathematics, physics, chemistry, astronomy and meteorology, zoology, agriculture, geological mineralogy, and physical hygiene. By the time of the sixth edition, the book had been expanded to 18 volumes and 3 issues—a basic issue, a special issue, and a hot issue: The basic issue includes mathematics, physics, chemistry, astronomy, geonomy, and life; the special issue includes zoology, botany, paleontology, medical science, architecture and traffic, and electronics and information; and the hot issue includes brain and cognition, ocean, energy and environment, aerospace and aviation, weapons and national defense, and disaster and protection. Each volume in each edition serves as an introduction to each discipline. Therefore, if you read this

set of books completely, you can learn the basic knowledge of various disciplines systematically.

According to research reported in *Science and Engineering Indicators* (National Science Board, 2006), a person's scientific literacy depends directly on whether he or she has received formal education. However, further investigation of influential factors revealed that science education in Chinese schools was not yet perfect and after-class study played an important role in the cultivation of scientific literacy (Ren, Zhang, & He, 2013). In Chinese education, characterized by exam-oriented education and cramming, *One Hundred Thousand Whys* effectively makes up the deficiencies of schools in scientific education, owing to its vivid form and comprehensive content.

As a classic, popular science book, *One Hundred Thousand Whys* strongly influences its readers in the Chinese Mainland. Today, with its revised publication half a century later, it can still provide insight for the propagation of scientific understanding.

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1. See Elsworthy (2017).

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